Invasive Species Game in Scratch	Grade 6 Understanding Life Systems

# Lesson Plan	Coding Tool	Block Code, Scratch
	Cross-curricular	

Big Ideas

- Because all living things are connected, maintaining diversity is critical to the health of the planet

- Invasive species disrupt existing ecosystems and can decrease biodiversity

Specific Expectations

3.7 explain how invasive species (e.g., zebra mussel, Asian longhorned beetle, purple loosestrife) reduce biodiversity in local environments

Description

Create a simple game in Scratch to demonstrate the damage invasive species can cause to the biodiversity of native ecosystems.

Materials

- Computer, chromebook or iPad/tablet with internet access
- Free MIT Scratch accounts (optional)

Computational Thinking Skills

- Block coding
- Loops
- Conditional statements
- Variables

Introduction

Scratch code is a form of "block coding" created by MIT for use in schools that you may already be familiar with. (If not, see "What is Scratch" at https://www.youtube.com/watch?v=jXUZaf5D12A)

We recommend you create a teacher account at https://scratch.mit.edu/educators#teacher-accounts so you can better manage the use of Scratch in your classroom, though that is beyond the scope of this lesson plan.

Though primarily used for creating games and game-like programs, Scratch can also be used to calculate mathematical operations. In this case, we are going to create a simple game that illustrates, rather than simulates, the danger of a specific invasive species: the emerald ash borer. A walkthrough in how to do this in Scratch is provided on the *Coding Guide* handout.

The game can be accessed on Scratch here: https://scratch.mit.edu/projects/447408754

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Action

Assist the students (as much as you deem necessary for your class, given their levels of experience and ability with coding) to produce the game demonstrated above.

At one extreme, if your students have very little experience, guide them step-by-step as in the handout, or provide them with the handout to attempt it themselves.

At the other extreme, if your students are already very familiar with the tool, you can give them the problem ("Create game to illustrate the danger of invasive species") and set them loose as an assignment. If you feel your students are advanced, but not quite *that* advanced, you can show them the game described in the handout and challenge them to recreate it without looking at the underlying block code.

Consolidation/Extension

Consolidation:
- Challenge your students to think of or research other invasive species they could base this game around, and to modify their code to do so.

Extension:
- Challenge your students to think of ways this game could be made more realistic, and how they might change the code to fit that vision. (For example, touching the beetles does not kill the mouse, or the beetles multiply when they reach the trees.)

Assessment

Simultaneously assess your students' pseudo-code (or flow chart) for understanding of the logical structure of the algorithm, and for understanding of the characteristic traits of creatures.

Additional Resources

https://scratch.mit.edu/

http://www.emeraldashborer.info/

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